N. S. Vol. 10, No. 4. April, 1921

BULLETIN

OF THE

Medical Library Association

QUARTERLY

SUBJECT-BIBLIOGRAPHY AND SHELF-CLASSIFICATION.*

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In medical library work, the functions and relations of bibliography and classification are sometimes confused, and varying ideas as to what these terms denote and connote lead to further confusion. The word "bibliography" (from *biblion*, a book, *graphein*, to write) originally denoted the writing of books. To the Greeks, the Bibliographos was a writer of books. In its modern usage, bibliography has come to connote or imply (1) The science of books, including the scientific description of a book, like an object in natural history, in such a complete and unmistakeable manner that its identification is always possible from the description; (2) a list, complete or select, of the known writings on a given subject; (3) a complete list of the writings of a given author. When such lists cover periodicals, public documents, societies, lectures, portraits, coins, medals, and the like, they are commonly called check-lists. Of the first of these three kinds of bibliography, we have excellent examples in the catalogues of the incunabula made by Hain, Coppenger, Voullième, Collijn, Pellechet and others; of the second, in the subject bibliographies in the Index Catalogue and Index Medicus; of the third, in such author bibliographies as those of the writings of the great physicians of Guy's Hospital by William Wale, of the late Dr. John Shaw Billings by Miss Adelaide R. Hasse, of Sir William Osler by Miss Minnie Blogg. The check-lists of periodicals, abbreviations of periodicals and portraits of physicians in the Surgeon General's Catalogue are good examples of the other class.

Bibliography therefore includes the scientific cataloguing of books and pamphlets, the subject-classification and arrangement of titles of books, pamphlets and articles indexed in periodicals, and the preparation of special lists of the writings of physicians, of periodicals on a given subject, and so forth. The classification of books and other writings by subjects is one of the most important phases of bibliography, in the derived or secondary usage of the term; and this species of classification must be sharply distinguished from the modes of classification employed for storing and arranging books and pamphlets on the shelves of libraries. Subject classification embraces not only the books and pamphlets, but also the contents of periodicals on a given science or group of sciences, and in the modern literature, the articles in the periodicals are often more important to the research worker than the books, since the former include newer investigations on the confines of human knowledge, while the latter summarize what has already been dis-

*Presidential address, Medical Library Ass'n., Washington, D. C., May 21, 1920. Printed by permission of the Surgeon General, U. S. Army.

covered and confirmed, or what is in process of becoming received opinion. This kind of classification requires not only considerable knowledge of the subjects considered, but a constant flexibility and adaptability of mind in relation to recent advances in the knowledge of such subjects. The ideal classifier of the modern literature of such a vast terrain as medicine should keep his mind open and adaptable to the "infinite number of compartments" which Rowland regarded as the necessary equipment for the scientific mind. "A history or law is in its proper compartment, indicating the probability of its truth. As a new fact arises, the scientist changes it from one compartment into another so as, if possible, to keep it in its proper relation to truth". Thus the astronomical system of Copernicus, the anatomical researches of Leonardo and Vesalius, Harvey's discovery, Newton's Laws, Dalton's atomic theory, the demonstration of the two laws of thermodynamics, Darwin's theory of evolution and the descent of man, Maxwell's equations for the electromagnetic theory of light, the Mendelian hypothesis and the Einstein doctrine of relativity have each, in their turn, profoundly influenced and altered the thoughts of mankind in regard to matters of fundamental importance, and with the introduction of each new discovery, new currents of ideas are set in motion, the scientific literature of the past takes on a different aspect and its separate items find their way into some compartment related to the historical development of the particular subject in hand. Even the artistic productions of the past acquire, some of them, a scientific significance. The drawings and polychrome paintings of bison and other animals in the prehistoric caves, the representations of squids and fish on Cretan and Mycenæan pottery, the beautiful paintings of birds, animals and plants in the illuminated missals and Books of Hours of the Middle Ages, are all true illustrations of natural history. Greek statuary and Quattrocento painting are of profound interest to the anatomist. Accurate pathological delineations of disease are found alike in prehistoric pottery, the gargoyles on mediæval cathedrals and Renaissance paintings. Even the gas attacks of chemical warfare are depicted in the older folios. In the ever-changing, "ever-widening sphere of medicine", this rearrangement of ideas and readjustment of values is going on all the time, particularly now, when all the fundamental sciences are ceasing to be descriptive and becoming dynamic or experimental, and when such sciences as physiology, experimental pathology, serology, genetics and the like are dealing with problems in the seventh decimal place, on the remotest fringes of recent knowledge. In classifying the titles of such researches, and particularly articles in medical periodicals, it is necessary, in each case, to find the true centre of gravity of the title, and in some cases, there is no apparent centre of gravity in relation to existing knowledge of the subject, especially where such knowledge is in a state of flux. Once the centre of gravity is ascertained, however, the selection of a proper compartment for classification becomes a simple and easy matter.

To illustrate by a few titles:

1. "Epilepsie treated by luminal; rapid death; latent cerebral tumor". In the first half of this title, the centre of gravity is the disease, not the drug; the sequel, however, deflects the interest from the drug to the pathological lesion. The best title would therefore be: Epilepsy (*Pathology of*).

2. "Potassium bromide in the treatment of epilepsy, delirium tremens, insomnia, melancholia, mania and other neuroses". Here the centre of gravity may be either the drug or a group of diseases. The most effective classification, however, would be Nervous system (*Diseases of, Treatment of*) or Neuroses (*Treatment of*).

3. "The value of quinine as antipyretic, tonic, antiseptic and oxytocic; with special reference to its use in the malarial and other fevers". Here the centre of gravity is the drug; the searcher in pharmacology will not thank you if you put the article under any of the conditions treated.

4. "Sarcoma and erysipelas". Here the interest would probably be with the effect of erysipelas toxins upon these tumors.

5. "Oligodynamic effect of metals on bacteria". Here the best provisional title would be Metals (*Oligodynamic effects of*), with the convention that articles on this subject would eventually be transferred to Bacteria (*Effects of physical and chemical agencies on*), provided the experiments prove trustworthy and of real value to the bacteriologist.

6. "Encephalitis lethargica, influenza, poliomyelitis, cerebro-spinal meningitis, ergotism and similar epidemics in the past". Here the provisional interest would be with encephalitis lethargica, as an important disease of epidemic magnitude, as correlated with other diseases, or as a modality of some other disease.

7. "The oculo-cardiac reflex". For bibliographical purposes, Reflex (Oculocardiac) would be the best title, with cross-references from "Eye" and "Heart".

8. "Wilson's disease". This may be either exfoliative dermatitis (Erasmus Wilson) or degeneration of the lenticular nucleus (Kinnear Wilson).

"Friedreich's disease—may be either hereditary ataxy or paramyoclonus multiplex". "Marie's disease"—may connote acromegaly or (indifferently) hereditary cerebellar ataxy, hypertrophic pulmonary osteo-arthropathy or the rhizomelic form of spondylosis deformans.

Do not classify any dubious title of this kind under the eponymic designation. Use the eponym only when referring to something definite, e. g., Stokes-Adams' disease, or where the true pathology of the condition has not been ascertained, e. g., Morvan's disease.

9. "Mental tests in school chidren, recruits, skilled laborers, officials, criminals and defectives". Here the best title is obviously Tests (*Mental*) or Tests (*Psychological*).

10. "The ætiology of syphilis, frambœsia, relapsing fever and the African spirilloses". Here the centre of gravity would be "Spirilloses" or "Spirochaetoses".

11. "Cancer and malaria", "Tuberculosis and syphilis", "Myalgia and oxaturia", etc. Indeterminate titles of this kind, in which disparates are bracketed, are very common in the recent medical literature of Germany, France and Italy. In each case, it is necessary to ascertain if there is any causal or other inter-relation, in brief what the author is driving at.

Obviously this mode of classification, the kind employed in the Index Catalogue, would not be applicable to the shelf-classification and arrangement of books in libraries and herein, I wish to say that

medical librarians and physicians sometimes acquire erroneous notions as to the shelf-classification employed in the Surgeon General's Library. The present classification in these alcoves is a provisional or opportunist classification, maintained at present on account of the crowded condition of our book-stacks and until we acquire more space in which to spread out and better exploit our material for public use. It has no relation whatever to the classification employed in the Index Catalogue or the new quarterly arrangement of the Index Medicus; it has no relation to the contents of our periodicals, nor even to our collection of pamphlets, which are at present stored alphabetically in numbered boxes and are classified as to subjects in the printed bibliographies in the Index Catalogue. The present shelf-classification is based upon the celebrated Royal College of Surgeons nosology of Dr. Farr, who was the first to classify diseases in a scientific manner. Up to January, 1921, this nosology, with some necessary changes due to recent advances in medicine, was employed in the monthly numbers of the Index Medicus; but it does not in the least follow that the subdivisions of this schema, mainly applicable, as they are, to the contents of medical periodicals, have any special application to the shelves of medical libraries, however useful the main titles may be. It will be found that the titles of medical books are usually best classified along broad definite trends, under the main grand divisions of the science and art of medicine, while articles in medical journals, as indicated in the above examples, run into the minutiae, and require much subdivision. This brings up the important question, so frequently put up to the Librarians S. G. O. by younger medical librarians: What is the best method to employ in classifying (for the first time) a miscellaneous collection of medical books? Is it best to build up a classification of one's own, out of hand, or is it more advisable to select and accept some classification, already made to hand, and adapt one's collection to it? The first method, I need hardly tell you, is inductive, reasoning from particular cases to general propositions; the second deductive, reasoning from established general propositions to particular cases. Let me illustrate by a parable. Suppose a person, with the normal self-regarding feelings, becomes the recipient of an enormous pile of money, of all ages, all nations and all denominations. Whether he follows the rational habit of self-preference. which Bentham assigns to most human beings, or whether he be actuated by altruistic designs, his first inclination would probably be to separate out the thousand pound notes and other bills of largest denomination, of whatever country, and to arrange the smaller bills and coins in piles of the different national currencies and in a descending scale of values. He would then be in position to take a true account of stock and to ascertain what he really has. But in order to do this, he would have to know beforehand all the currencies of the various nations in the different periods of time, their relative value, if real exchangeable money, or their prospective value, if sought after by collectors.

Unless he is at once an experienced banker and antiquarian coin collector, his best guide, in either case, would be some book or books giving the requisite information. Assuming your prospective medical library to be a large roomful of unclassified books and pamphlets, the best plan would be to block out some simple arrangement in your mind, or on paper, and proceed accordingly; first picking out the books of greatest intrinsic value (the future shew-bread of your collection), storing these in a safe place against loss or theft; and classifying the other items in large groups, according to the number of items in any given group. Leaving the arrangement of the smaller and more puzzling items to the last, you will probably find that your main divisions will run, at least in part, to the following arrangement:

Biology (including Botany, Zoology, Natural History).
Anthropology (including Craniology, Ethnology, Folklore).
Chemistry and physics.
Anatomy.
Physiology.
Pathology.
Bacteriology and Parasitology.
Practice of Medicine.
Diagnosis.
Pharmacology and Therapeutics.
Biography and History of Medicine.
Pediatrics (Children).
Surgery (including Radiology and Orthopedics).
Gynæcology
Ophthalmology (Eye)
Laryngology, Otology and Rhinology (Ear, Nose and Throat).
Dermatology (Skin).
Dentistry (Teeth).
Hygiene and State Medicine.
Medical Jurisprudence, Toxicology.
Military and Naval Medicine.
Nursing.
Veterinary Medicine.

Over and above these main grand divisions, you will undoubtedly find a large number of books and pamphlets which will have to be classified by the anatomical regions and organs of the body, e. g.,

Circulatory System: Blood, Bloodvessels, Heart.
Genito-Urinary System: Bladder, Urethra, Ureter, Prostate.
Locomotor and Motor System: Bones, Joints, Muscles.
Nervous System: Brain, Spinal Cord, Nerves, Sympathetic System.
Respiratory System: Lungs, Larynx, Nose, Throat.
Ductless Glands: Thryoid, Suprarenals, Pituitary, etc.
Metabolism.

And other groups will require further specializing, e. g.,

Aneurism.
Tumors
Wounds.
Fractures and Dislocations.
Medical Geography.
Climatology.
Mineral Waters.
Tropical Medicine.
Industrial Medicine.
Social Medicine.
Diathetic Diseases.
Cancer.
Diabetes.
Gout.
Rheumatism, etc.
Communicable Diseases.
Typhoid fever.
Smallpox.
Tuberculosis.
Venereal diseases, etc.

Your collection may also, by chance, include some very complete special collection or collections, turning upon any particular hobby of the donors, e. g., Cataract, Medical Numismatics, Medical Incunabula, Hippocrates, Galen, Sydenham, Paré or other old authors, Acupuncture, History of Ophthalmology or what not.

Having disposed of your items in piles or groups, the next important question is that of arrangement upon your shelves. And right here is where a good shelf-classification already prepared, such as that of the Boston Medical Library, is of most value. For it turns out that the arrangement which is of most tactical convenience is also the most scientific arrangement, both as to economy of time and space in administration and as to the logical relation of the different subjects to one another. Thus it is always of advantage to group together the physical sciences (chemistry, physics, spectroscopy, etc.), the biological sciences (botany, zoology, phytology, bacteriology, parasitology), anatomy and physiology, surgery ophthalmology and oto-rhino-laryngology, gynecology and obstetrics, internal medicine and pediatrics, dermatology and venereal diseases, not only for the logical merits of such an arrangement, or because such titles sometimes overlap in one book, but also because it is cheaper library administration. With a tactical arrangement, the book-searchers can easily pass from any subject to the correlated subject and not lose time and dissipate energy by wandering vaguely about the alcoves. In arranging subjects by anatomical regions or organs, keep the anatomy, physiology, pathology, therapeutics and surgery of the particular designation together, e. g., in the case of the lungs, the liver, the ductless glands and so on; keep all related subjects adjacent to one another, e. g., Lungs, Bronchi, Larynx, adjacent to the Respiratory System; Blood, Bloodvessels, Heart, Aneurism, Varix, etc., near the Circulatory System. In a modern arrangement, books on the different communicable or infectious diseases, e. g., Typhoid fever, Measles, Smallpox, would best be grouped in the same locality, as also the diathetic disorders (Cancer, Diabetes, etc.) with the related endocrine disorders. It is best to group Surgery in its technical relations, e. g., Orthopedics, Roentgenology, Fractures, Dislocations, First-Aid, etc., leaving the special surgery of regions and organs under these locations, as above; for most modern treatises on such subjects include both pathology and surgical treatment. This is the practice in the Boston Medical Library, where it has been found to be of vast tactical convenience. Having blocked out your general plan of classification and tactical arrangement, it will be found that further refinements are usually negligible in a small collection, but that the tactical idea will deserve very detailed consideration in a large collection, with extensive bookstacks, particularly where the collection has to be distributed over considerable space, as in different rooms, different stories, along stair-cases or in widely separated cases or stacks. Generally speaking, current unbound periodicals, available reference books and new books are best kept on open shelves in the general reading room, for the immediate use of the public; the files of unbound periodicals should be readily accessible and arranged alphabetically or by countries, in tactical order, as called for, e. g., U. S., Great Britain, France, Germany, Italy, etc. Rare items and incunabula should be kept under glass, for safe-

keeping and as exhibits. The fundamental sciences and main subjects (internal medicine, surgery, obstetrics, etc.) should take precedence over those more recondite and less called for, such divisions as anthropology, dentistry, veterinary medicine, public documents, etc., being usually relegated to the more distant shelves. Old authors, elephantines, folios, quartos and expensively illustrated books, as also valuable engravings and portraits, should be kept in known places, not too far away, in the event of fire. Arrangement of periodicals under special subjects, such as Anatomy, Surgery, Obstetrics, etc., is bad practice, as the titles sometimes include two or more subjects, or are otherwise misleading. In one of our leading libraries I saw the current "Military Surgeon" under "Surgery," although the title of this periodical is only the earlier synonym for "Medical Officer," and its contents deal mainly with sanitation and medico-miliary administration.

At the request of some members of the Association, a list of useful references is subjoined:

I. GENERAL BIBLIOGRAPHY.

Petzholdt (Julius): Bibliotheca bibliographica. Leipzig, 1866. An exhaustive analytic catalogue of bibliographical works on all subjects, up to this date, including medicine (pp. 571-603).

Valée (Leon): Bibliographic des bibliographies. Paris, 1883.

Stein (Henry): Manuel de bibliographic générale. Paris, 1897.

Hortschansky (A.): Bibliographic des Bibliotheks-und Buchwesens. Leipzig, 1905-13.

Moth (Axel): Technical Terms used in Bibliographies. Boston Book Co., 1915.

II. METHODS OF CATALOGUING.

Walter (F. K.): Abbreviations and technical terms used in book catalogues and bibliographics. Boston Book Co., 1915.

For forms employed in book-cataloguing, see the Index Catalogue of the Surgeon General's Library (1880-1921), the Catalogues of the British Museum, Peabody and other Libraries, and the printed cards of medical book titles issued by the Library of Congress.

III. CATALOGUING AND STUDY OF THE INCUNABULA.

Peddie (Robert Alexander): Fifteenth-Century Books, London 1913. The best introduction to the subject.

For forms employed in cataloguing, see the *Reportorium* of Ludwig Hain (4 vols. Stuttgart, 1826-8), and the subsequent lists of W. A. Copinger (1895-1902), Reichling (1905-11), Ernest Voullieme (Leipzig, 1905-16), Isaak Colijn (1907-14), The Prussian Kommission (Leipzig, 1910) and others. Also: Papers Bibliog. Soc. America, Chicago, 1916, X, 143-163 (A. C. Klebs).

IV. INDEXING AND CLASSIFICATION.

Clarke (A. L.): Manual of Practical Indexing, London Library Supply Co., 1905.

Brown (James G.): Manual of Library Classification and Shelf-arrangement, London Library Supply Co., 1898.

Bishop (W. W.): Practical Handbook of Modern Library. Cataloguing. Baltimore. Williams & Wilkins, 1914.

Brown (John D.): Subject Classification. London, 1914.

Sayers (W. C. B.): An Introduction to Library Classification. London, Grafton and Co., 1918.

Sayers (W. C. B.): Canons in Classification. London, Grafton & Co., 1915.

Sayers (W. C. B.) and Stewart (J. D.): The Card Catalogue. London, Grafton & Co., 1915.

Dewey (Melvil): Decimal Classification, Lake Placid, 1876.

Library of Congress: Classification, 1904-21.

For the systems of classification used in the medical libraries of Philadelphia, Washington (S. G. O.) and Boston, see Bull. M. Library Assoc., Balt. 1911-12, n. s. I, 3-26 (C. P. Fisher): 1916-17, VI, 60-70 (C. C. McCulloch, Jr.): 1917-18, VII, 33-63 (J. F. Ballard).

For abbreviations used in indexing medical literature. see the Alphabetical Lists printed in the different columnes of the Index Catalogue, S G. O. (Cummulative list in 2s. XXI, 1916), also American Medical Association: Suggestions to Medical Authors, 1919.

Aside from these few random hints, each medical librarian has to work out his own destiny and salvation in the matter of arrangement, since almost every important medical library has features and peculiarities distinct from and not common to other collections. One collection will be particularly strong in medical periodicals, another in public documents, another in incunabula, another in history of medicine, and for all such unique collections some special disposition has to be made. The plan and arrangement of the library building, its special topography, must necessarily be the basic consideration in any arrangement. The alcoves of the Surgeon General's Library contain only bound volumes, requiring a relatively simple classification and arrangement; but where unbound material, periodical or other, is also placed on the shelves under subjects, a more extensive, shelf-classification, such as those employed in the Boston Medical Library or the Library of Congress, may be found to be desirable. In this case, it will be necessary for the younger librarians to use the medical dictionaries extensively in order to familiarize themselves with the minutiæ of medical terminology; for while the main grand divisions of classification in medicine are not likely to change, the more advanced and specialized phases of the subject are constantly shifting in their relative relations. Indeed, if one may judge from the past, the physician who peers into the future will surmise, with the poet, "far regions of eternal change." In a prospectus of the "Handlist of Scientific MSS. in the British Isles dating from before the Sixteenth Century," now in preparation by Mrs. Dorothea Waley Singer, we find the following medical titles used in the classification of these 30,000 mediæval mss.:

Alchemy and Chemistry.
Anatomy.
Aristotle.
Astrology, Menology.
Bestiaries.
Charms and magic.
Children (Pediatrics).
Cosmology.
Diet.
Fermentation and Generation.
Fevers.
Gynaecology.
Haematoscopy.
Herbaria
Hospital.
Lapidaries.
Marvels.
Mathematics (usually cultivated by physicians).
Measures and weights.
Medicine (General).
Melothesia.
Ophthalmology.
Pestilence, Contagion, Epidemics.
Phlebotomy.
Phyiognomy, Chiromancy.
Physiology.
Pulses.
Recipes and Drugs.
Regimen.
Surgery.
Urine.
Veterinary.

Had medical libraries of any particular size existed in the Middle Ages (such collections were usually small), the above, or something like it, would have been the probable scheme of classification. Of the 33 titles employed, at least 12 are now obsolete, and only 16 in all would have any special weight or significance in a modern arrangement of medical books. By the past may we judge the future, keeping our minds open, flexible and adaptable to change in our medical environment, nor endeavoring to impose any rigid rules, regulations or restrictions upon those who are to follow us. It has been well said that, in the moral world the dead are our masters. "Life is but a continued hypnotism; and the thoughts of others reach us from every side, determining in some measure our actions." In science, in medicine, at least, let us endeavor to leave a larger and more liberal legacy, a system with many degrees of freedom, to the children of the future:

"The dead make rules, and I obey,
I, too. shall be dead some day,
Youth and maid, who, past my death,
Have, within your nostrils, breath,
I pray you for my own pain's sake,
Break the rules which I shall make."

FIRST STEPS IN MEDICAL LIBRARY WORK.

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By way of preface I want to explain just what this paper is. It was read before an advanced class in the New York Public Library School as one of a series of lectures on special libraries. Hence it may seem to you as elementary and inadequate for this occasion; but it represents an introduction of library-trained people to the medical library. I have, however, omitted local allusions that have no particular interest here and have added some remarks on steps toward a closer acquaintance.

Medical literature, as is that of any living, growing science, is of surprisingly great extent. It is surprising to the layman especially, both in its accumulated mass and in its annual output in book and periodical form. A library like that of a medical school will take from 50 to 200 journals and receive as gifts as many more. A library of a great medical society will subscribe to or receive free 800 to 1000 periodicals and have some 100,000 books and bound volumes on its shelves. The Library of the Surgeon General's Office, which is in a class by itself, had at the last report about 230,000 volumes, 352,000 pamphlets and was receiving about 800 journals, not including transactions. When one appreciates the fact that writers quote Hippocrates and other authors from the age of Pericles to the present, one sees that there is a long history

to medical literature, and that writings on a subject so vital to humanity as the treatment of disease, extending over a period of more than 2,000 years, must amount to a vast number.

A glance at the figures which tell the numbers of physicians, to say nothing of the professions allied to medicine, and of the medical schools, will show something of the public for which this literature is being published now, and of the body of potential writers who are supplying this literature. The American Medical Directory gives for the U. S. a total of 147,000 physicians; for Canada and other sections, about 12,000, a grand total for North America of 159,000. The American Medical Association numbers over 40,000. To supply the ranks of the profession are the medical schools.

Medical schools in this country sprang up like mushrooms, in the early Victorian period and in such places as Louisville, Geneva, N. Y., Buffalo and Cincinnati. Planted, as many of them were, by men of originality and force they flourished under the master's hand to decline under another's. The statistics are interesting.

Between 1810 and 1840, 26 schools sprang into being.

Between 1840 and 1876, 47 schools sprang into being.

In the United States and Canada there have been 457 schools, of which about 100 now survive. Of these 39 were in Illinois, 42 in Missouri, 43 in New York, 27 in Indiana, 20 in Pennsylvania. The city of Cincinnati was the seat of 20, Louisville of 11. Today they are greatly reduced in number, the schools in the United States numbering 98 in 1919, but each is far in advance of any of the old style schools, in personnel, equipment and resources. With this advance the library has become a recognized part of the medical school's equipment.

The growth of libraries in the schools has been usually something like this. A teacher sees that lack of books hampers his student's work. He brings to the class-room some of his own, and then as he sees the advantages, he brings his whole library of technical and professional books to the school. Other teachers are doing the same thing and finally the authorities see fit to buy a few books or journals every year. As the collections increase it is seen that useless duplication of material and expense is taking place. Finally it is decided to combine the separate collections, or a new building offers opportunity for such a move, and a single library is formed. If the school is prosperous a librarian may be engaged.

Then comes the problem of redistributing certain volumes or sets for the departments that require them in the class-room, or of maintaining such correlation between the library and the department that each is served to its satisfaction. The teachers will be found to require not only books but sets of journals of the most special nature, whereas the student library will consist largely of text-books and the more general medical journals.

The formation of medical societies in the larger centers, the amalgamation of older ones, and the rejuvenation of others, have

been in many cases the beginning of medical libraries. Libraries that once were simply shelves laden with the sheep-bound reprints of foreign authors of the 40's and 50's, the cast-off volumes of the members' own libraries, are now coming into their own. They are classified, catalogued, have a librarian in charge, and, still more interesting, have financial support sufficient to keep them up to date.

Some of the best known of the medical libraries are maintained by societies. The New York Academy of Medicine was founded in 1847 and has had a library since early in its career. In 1898 it received as a gift the library of the New York Hospital, which dated back to the 18th century. This gift numbered 23,000 volumes. Since that time the Academy library has more than doubled in size, now having 116,000 volumes, and has become one of the hardest worked of medical libraries. The Boston Medical Library was founded in 1875 with Oliver Wendell Holmes as president, for the very purpose of maintaining a medical library. This and the library of the College of Physicians of Philadelphia are about equal in size with the library of the Academy.

Other libraries have grown up in hospitals, in the offices of boards of health, in laboratories doing commercial work and in the offices of physicians. The latter are frequently the occasion of real library work. Libraries, non-medical for patients in hospitals and asylums, have also come into being and have been described very fully in the various contributions of Miss Edith Kathleen Jones of McLean Hospital, Waverly, Mass.

Medical libraries and their history have been treated under "Libraries," by Dr. Fielding H. Garrison, in the Reference Handbook of the Medical Sciences (3rd ed. N. Y. W. Wood, 1915. V. 901-910).

To consider now what special preparation a medical librarian should have is a difficult undertaking. The person who has the ideal qualifications for a medical librarian would probably not be a librarian but the head of a university or of a department thereof. He should first of all be a librarian, a bookman, with that historical sense which preserves the present for the future. Then the letters M. D. affixed to his name will put him on terms of intimacy with the literature he handles. Special work in chemistry, physiological chemistry especially, will help him out in the field in which so much is now being done. After he has qualified as a doctor of dental science and has graduated from the college of pharmacy he begins to be of real service to the scientific men of the community. He will not find a knowledge of agriculture and veterinary medicine a handicap. By this time he will be a fluent linguist in the European languages with considerable knowledge of Japanese and Chinese. I suppose I am sketching out too ambitious a program. Certainly no one that I know begins to fulfill the conditions, but all that I have mentioned would certainly be of great use in a medical library. To state it more simply: library training, a working knowledge of German, with as much French and Italian as you can

add to it, what you have left of Latin or Greek from high-school days; these are a good first line of defence from which you may begin your campaign as a medical librarian.

Medical journals comprise one great section of the library material, as you are aware. These are published in all languages with German, French and English supplying the greater part. It is to these that the majority of writers refer, as these languages are the most widely read. In frequency of publication they range from the triennial transactions of an international congress to the daily reports of the same congress. In any case they supply the great demand for "the latest you have" on any subject, which is what the reader wants. These periodicals run into the hundreds in this country alone, as they do in France, Germany, Russia and Italy, and range from the popular Herald of Health to the Journal of Immunology. They vary, as they do in other fields, in quality. Usually the more scientific or specialized is the subject to which the journal is devoted, the more scientifically the journal is edited and printed. They are all prone, however, to run old, new and third series, to issue supplements, and now and then change the title or size. The *well-indexed* journals become by that indexing our veriest reference books and help us out of many a tight place. In them are found the earliest mention of new work, and it is largely for the sake of these as historical material that the bound volumes need to be preserved. A set of bound volumes of a specialist's magazine enhances in price with the passage of years, but a text-book is only so many pounds of paper when a new edition is issued. In fact we can better afford to divide our text-books into the quick and the dead and bury the latter than to do the same to the journals.

In periodical literature society transactions occupy a considerable share of the field. Though their publication is often far behind the reading of the papers, they are usually of a higher standing than many contributions to journals of more timely appearance. Membership in the society is supposed to represent a certain standard of scientific attainment, and appearance on the society's annual program presupposes careful and complete presentation of the subject.

The classification of these offers difficulties of its own. The method in use at the Academy has its advantages and disadvantages. We put together international congresses, alphabetically by certain specified subjects, as medicine, hygiene, surgery, etc. Of societies in the United States we shelve together, alphabetically by title, the national societies in one class, the state societies in another, and those of smaller locality in another. Transactions of other nationalities are shelved by title with the priodicals of that language. Thus it is only American societies that receive the distinction of separation. We are thus compelled to decide whether a publication of a society is to go with transactions or with the journals, a question that is sometimes to be settled only by an arbitrary ruling.

For periodicals in general our arrangement divides them into classes of language, shelving together American in one class, all British in one class, French in another, German another, Italian, Spanish, Scandinavian each in classes by themselves, with another class for all others—which includes Russian, Japanese, Rumanian, etc. If we were doing this over I believe we would put periodicals in all these languages together into one alphabet.

A great quantity of material of a statistical nature, less frequently of a descriptive sort, is issued by health boards and other departments of cities, states and governments. Here one finds the weekly and monthly bulletins, annual and special reports on medical and vital statistics, public health, and the like. These have their place in a medical library, but this varies with the scope of the library. Thus a municipal library may keep only the last reports of each bureau, while the health department library will keep only health department reports but those complete; and the medical school will elect to keep none. The publications of the U. S. Department of Agriculture are of considerable interest to the medical library. These will come into the library by the dozen and treat on a variety of subjects, from a plan of accounts for a farmer, to how to feed the baby. These bulletins and circulars deserve a wider publicity than they have hitherto been given. They are indexed by the department, which prints the catalogue cards for them. A governmental report may be the only publication of value on some subjects. The U. S. Geological Survey publishes reports on mineral springs that are authoritative and the last word.

A characteristic feature of the medical library, whether public or private, is the presence of a large collection of reprints. The a reprint, as you know, is the independent republication of an article that has appeared in a periodical or similar work. In 99 out of a hundred cases it is a paper covered pamphlet of from 2 to 16 leaves, and of duodecimo or octavo size. The other ten per cent are of larger page or of greater number of pages.

Now in medicine the pamphlet called the reprint has an almost unique function. Outside of the magazine from which the article is taken the reprint is the only means of ethical advertising possessed by the physician. By judiciously sprinkling copies of the reprint among his friends or in other directions he is permitted by his code to bring his work and methods to the attention of others. As a result physicians' offices soon become more or less filled with reprints, many of which find their way to the library. Many physicians send their reprints directly to the library, but too often only when the librarian asks for them. A campaign for reprints under the librarian's direction brings in a mass of valuable material in this form.

Reprints are of value in a library for several reasons. The first is that for purposes of circulation a handful of reprints takes the place of a dozen ponderous tomes, a process pleasing to the man borrowing them, and to the librarian, in that the library's reference

value is no whit impaired. In another way the reprint increases this reference value, through acting as an index to the bound journals. Our usage at the Academy shows this. We catalogue our reprints as we do books, so that the catalogue is an index to a considerable percentage of magazine articles.

Our experience has shown us that a doctor's memory or bibliographic habits are no better than other people's. He is coming to us to find out when he wrote such and such an article as he has given away all his reprints. Or he read Smith's article, but doesn't know when or where it was printed, or just what it was about. If we have the reprint our catalogue shows it to him. If not, we may have a half-day's search before us.

A fourth purpose which the reprint fulfills is in giving the complete article. Space in a magazine is sometimes so precious that the details of a case or the list of references must be omitted. These portions are restored in the reprint, an addition that correspondingly increases the value of the reprint, giving it a greater value than it had in the journal.

Our reprint collection, which includes a large number of pamphlets not reprints, now numbers over 75,000 items, not counting pamphlets that we have in bound volumes.

Our method of taking care of pamphlets is to file them alphabetically by authors in a vertical file. A case of thirty-six boxes holds seven to nine thousand pamphlets at a cost of about a cent a pamphlet. The catalogue shows what we have.

A great question is buying books, especially with small funds. In some of the leading lines of medicine, as practice, pediatrics, therapeutics, surgery and others, a new text-book appears about every year and is reprinted in new editions every two years. Which of these to buy, which to wait for till donated, are questions which may well be put up to a committee on library. Such a committee would probably recommend that Osler's Practice, Gray's Anatomy, Holt's Diseases of Childhood, and some others should be kept up-to-date, with possibly duplicates also.

Having fixed upon the standard text-book in a subject, your next problem will be the monograph. These are as numerous texts and are often in great demand. Thus Cushing's book on the pituitary body, published in 1913, is still an authority and as much read as ever.

A class of monographs for which there is considerable call is the inaugural dissertation. This line may be left to the largest libraries to supply, except perhaps for special items.

The question of old and rare books may be put in the hands of a physician who is a collector. The library will be sure to get books by gift, and in large numbers, that are too old to be of use and not old or rare enough to give them a bibliographic value. The large libraries find the latter accumulation one of its problems: whether to keep on the shelves or put in a store room or get rid of altogether.

As in other libraries there is a great demand for the new book. More so is this the case perhaps in a science or art, like medicine, than in general libraries. The smaller the fund available, the more care has to be exercised in the choice of the book to be bought. In a small library I should take a journal, say the Journal of the American Medical Association, and stick to the reviews found therein.

If you are near a publishing center it is possible to get books on approval, both domestic and foreign. A book in the hand is worth two in the bushes; for a reviewer may not say that the book he admires has no index, or has not been revised since 1904. A scientific book needs an index in spite of anything that some people maintain. Charles Mercier, whose book on insanity has some reputation, states therein in effect that an index is all tommyrot and is only a crutch for a crippled reviewer. Another point to take into consideration in a book is the presence of bibliographies. These are a very real help in time of trouble, a veritable godsend to the librarian. The bibliography is a great part of the value of the German Handbuch, of which every specialty in medicine has its representative. Hundreds and even thousands of references are given which practically cover the subject up to the date of publication. American and English authors are beginning to take a leaf from these systems by doing the same thing with even a greater degree of accuracy and method.

Don't be afraid to ask authors for gifts of books and periodicals. Many gladly put you on the free list, others may not have thought to do so.

In your cataloguing some points may be worth emphasizing:—as bibliographies, colored plates, portraits and the like.

Several years ago we began an index of portraits that we ran across from day to day, indicating a biographical sketch also when found with the portrait. We find this of great use and regret we had not made it primarily a *biographical* and *portrait* index, with a cataloguer who could spend full time on it. The Index-Catalogue gives such material too, but is of course, far from being up to date under all names.

This may be a good place in which to tell something of the Index-Catalogue of the Library of the Surgeon General's Office, U. S. army. The credit for beginning and continuing this for many years belongs to Dr. John S. Billings. Throughout the world it is recognized as one of the greatest of bibliographic works. Dr. Garrison's life of Dr. Billings tells of it in considerable detail. The Index-Catalogue enters books by author and subject in dictionary form, magazine articles by subjects only, except that in Series 1 and 2 reprints are entered under author's name also. The year 1880 saw the publication of the first volume covering A-Ber. In 1881 a second volume, B—was issued covering under B, the same material that the first volume did and also what was published since

volume one, under that letter. The alphabet was completed in sixteen volumes at the rate of one a year, each one covering the field to its own date under the letters indexed. For material under A, between 1880 and 1895, a new volume was necessary and a new alphabet was begun in a Second Series of the Index-Catalogue which was finished in 1916. A Third Series has now begun. This work a medical library needs above others. While on its face this catalogue is only a library catalogue it is in effect an index of the medical literature of the world. It is true that much printed material does not get into this catalogue, it is also true that so much is included that few searchers miss anything of importance through its use. We use this catalogue as a code for subject headings and author's names.

Moving through the mountains of medical literature with equal step is the Index Medicus. This is a monthly index of the same material as the Index-Catalogue. It was begun in 1879 and has come out at monthly intervals since then, except for a period of three years, 1900 to 1902. Allowing for delays in issue of the periodicals indexed, and for the great amount of care necessary in an index, the Index Medicus comes out fairly regularly and fairly up-to-date. Its material is in classified form, with an annual index, but the latter is far behind the end of the calendar year. In 1916 the American Medical Association began to issue a Quarterly Cumulative Index which supplements the Index Medicus in some respects, but it indexes a comparatively small number of journals. Previously, the index of the Journal of the A. M. A., issued twice a year, was our recourse as such a supplement.

In foreign literature there are a number of journals that take up the problem of indexing literature, with abstracts, in larger numbers than in English. These are principally German, each specialty having a *Centralblatt* or *Jahresbericht* in addition to those for medicine as a whole. Since the war journals of this sort have begun to spring up in this country in addition to the few we had when our supply from Europe ceased. This class of magazine is of the greatest assistance in rounding up the elusive "wrong reference".

A large share of the librarian's time will be taken up with reference work. While many people come to the medical library, as to any other, to read definite books, there is another large number who come seeking for information, regardless of its source. One will want the definition of a word, another the description of a disease, another the last word on a new method of treatment. The variety of questions is just as great as in the reference department of any other library. The questioner may himself have tried the dictionary, the text-book, and the catalogues, and now comes to the librarian. The latter, equally ignorant of the subject, is now to decide whether the new word is a drug, a disease or a delusion (it is often the last.) Perhaps a different dictionary, text-book or

monograph, or a different word in the catalogue will answer the question. Any book, however humble, becomes a reference book at some time or other, but the mainstays are the Index-Catalogue, the Index Medicus, the Quarterly Cumulative Index, and the special indexes and journals.

Some librarians claim they use their catalogue only occasionally. We, however, go to the cards first. We enter by subject and author not only books and serials, but, as fast as we are able, reprints of magazine articles. Therefore our catalogue has comparatively new material from journals in separate form. On many an occasion our catalogue entry is nót only a great saver of time, but for the purpose the reader hits the nail exactly on the head. The reprint or pamphlet found thus is often the only thing we have catalogued on the subject, and, through its list of references, gives us clues to the whole literature.

A phase of reference work that is of great interest and that consumes more time than it should is the search for the lost or misquoted reference. Physicians seem to be the most careless people in the world in quoting references though, or because, they do a great deal of it. Imperfect or incorrect citations often constitute as much as ten per cent of the list. That is to say one out of every ten items omits a vital part of the reference or gives it in such incorrect form that the original cannot be found at once. If you have a Sherlockian disposition you will enjoy trailing these papers to their hidden lairs. One such paper was quoted in several journals, French, American and German, as in a mythical "Bull. Med. and Surg., 1900." This was found after a long search in the "Finska Läkaresällskapets Handlingar," of 1899.

To prevent the occurrence of such errors in future work is one of the educational branches of the librarian's work. We keep a collection of papers on the subject of preparation of medical articles on our library tables and take every possible occasion to impress authors with the necessity of eternal vigilance in transcribing, verification and proof-reading of references.

In the matter of classification many schemes are extant. The one that shall come nearest to perfection, if such a thing there be, is the one that shall arrange the material that we have to handle; that is to say, books rather than ideas. It shall be simple enough to be readily remembered and applied and complex enough to separate unrelated material. As long as men exist differences of opinion will continue as to what arrangement is best. Our own arrangement has its disadvantages but it has the advantage of simplicity, a relatively small number of classes into which material falls naturally.

The various schemes in use in some of the larger libraries have been described in the Bulletin of the Medical Library Association.

Surgeon General's Library, Bull. Med. Lib. Assoc., April 1917, VI, 60-70.

Boston Medical Library, Bull. Med. Lib. Assoc., Jan. 1918, VII, 35.

College of Physicians, Bull. Med. Lib. Assoc., July 1911, I, 3.

Medical Society of the County of Kings, Med. Library and Hist., J. I, 1903, 35-43.

The last was based on that of the New York Academy of Med-- icine and gives something of an ideal of the classification in use in the latter.

When one goes into a medical library work as I did he meets at once a subject which is unfamiliar to his past experience in two ways: in the subject, per se, and in the language which conveys that subject. To hasten familiarity with both it seems to me that steps should be taken by those in charge of the library, librarian or other official, to enable the novice to take courses of instruction of a special character in anatomy, physiology, bacteriology, for instance, and in the medical terminology. Courses of this kind, are, I believe, not in existence. The medical schools have courses in these subjects that are too exhaustive and exhausting for the busy librarian to avail himself of. What I have in mind is a sort of a personally conducted tour. Teachers of these subjects will then take the newly made librarian on a sort of motor or airplane trip and point out the principal points of interest with short explanations of the functions and disorders of each. The landscape of medicine will then begin to assume the form of a populous and prosperous country instead of that valley of dry bones that it remains for so long in many a librarian's mind. Having arrived at an idea of the outline of this country, of its topography, geology and climate our traveller may profitably take up its history and relations with other countries by reading an *"Introduction to the history of medicine"* by a well-known fellow traveller, and feel that he is becoming a citizen of no mean country.

The training in medical bibliography will not be difficult to one having library training to begin with; but a little guidance along tried lines by one having experience will not come amiss. Some time ago I saw the suggestion for exchange librarians, along the lines of the exchange professors. Why not import for several days such an experienced person for the intensive training of the tyro in the various lines of reference work and in bibliographic aids peculiar to medicine? All this of course for putting the newly elected librarian on his feet. The larger medical libraries may attract workers to the medical field by inviting the library schools to send students to them for visits of observation and of actual work in the library, thus giving these people a much clearer idea of what the medical library does. This association is already doing a good work for those already in this work, but only at long intervals and for those who attend the meetings, principally. In 1912 a committee seems to have been appointed to consider the question of a medical library school to be held at the annual meeting but I have found no further reference to it.

As a further idea along this line "may I not suggest" another course of training for certain people who hardly know the library from a handsaw? A lecture course, at least, is needed I believe, for a class of men who would laugh at the idea of its necessity, but who would receive benefit, I doubt not, from the ideas there presented. I refer to a lecture course on the functions, duties, and opportunities of the library *trustee*.

What this association is to librarians, the staff-meeting, of one sort or another, should be to the assistants and librarian in the large libraries. Team-work, the interchange of ideas and news from one to another, and the stimulus to special investigation through reports on assigned subjects are furthered by such meetings. They are really a necessity in libraries where several departments are more or less separated by space and the time-element of schedule of work. Discussion and reports are specially valuable in the definition of one's own knowledge, or lack of it. Forcefully proved when one attempts to impart knowledge is the pedigogue's saying: "Thou that teachest another, teachest thou not thyself?"

I have thus tried to indicate some of the ways and means, tried and untried that may be used to start the library worker in his journey through Terra Medica Incognita. This has been but a sketch map. It does not show very much of any one road, but I hope that the scale is fairly correct, the points of the compass and the variations of the needle are indicated aright and that the explorer is headed in the right direction. Once off the map he must climb to a commanding point and begin to map out his own route.